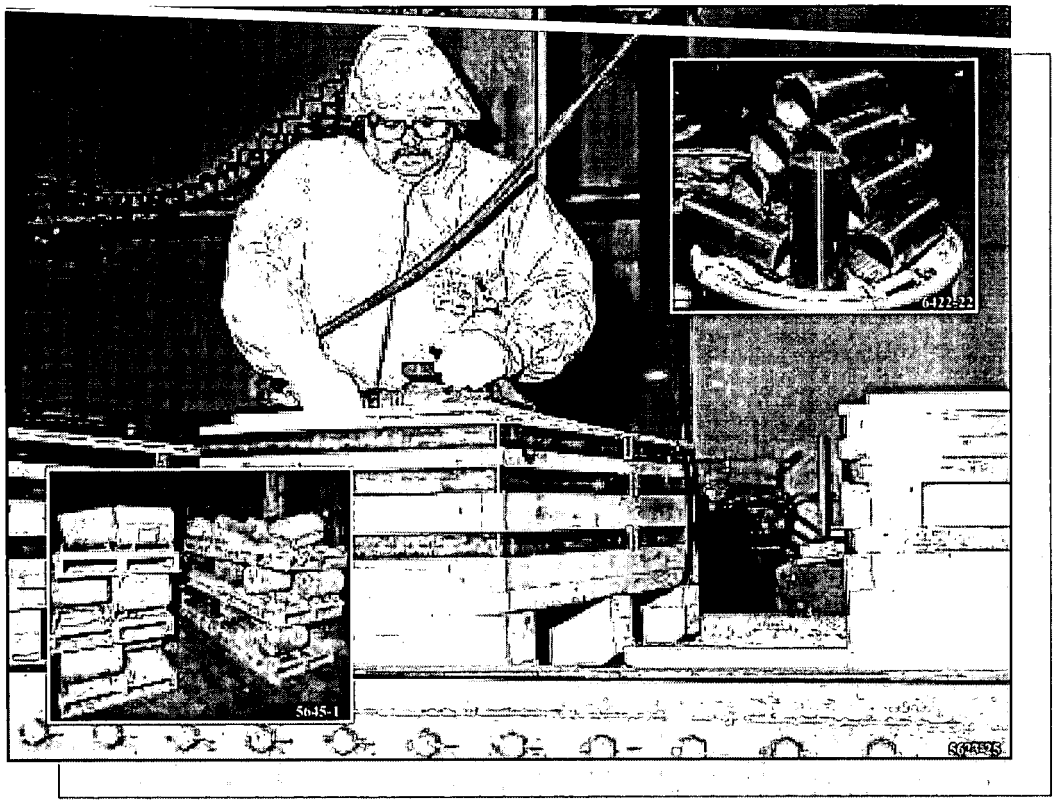
3261

Nuclear Materials Disposition

Fact Sheet



Since production ended in 1989, more than half of Fernald's inventory of uranium has been removed from the site. DOE and Fluor Daniel Fernald are working to sell the remaining inventory, or pursue other disposal options. All of Fernald's nuclear materials are expected to be removed from the site by the end of 2000 (5623-25 [depleted derbies]), 5645-1 [enriched ingots], 6422-22 [normal fuel elements]).

Description

When the production of "feed materials" ceased at Fernald in 1989, and the mission changed to environmental restoration, approximately 31 million pounds of nuclear materials had accumulated on site. "Feed materials" were uranium products that were supplied to other defense-related facilities within the Department of Energy (DOE) complex. In 1989, DOE started pursuing several different options to dispose of the material including transferring it to other DOE facilities for programmatic use, selling material with market value to the private sector, and disposing of some of the materials as waste.

Fernald's uranium inventory is divided into three broad categories: depleted, normal and enriched. Each category is unique based upon its use and requirements for storage, packaging, and transportation. Within each category, there are various physical forms of materials including derbies, ingots, fuel cores, compounds and oxides packaged in many different types of containers such as T-Hoppers, drums, and boxes.

1

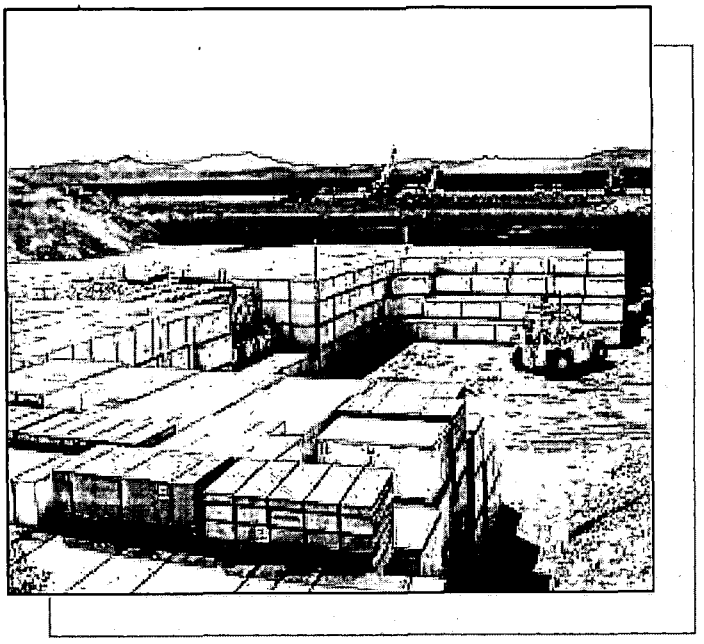
Depleted Uranium

Depleted uranium consists of a U235 level that is less than that found in nature. The range for natural uranium is 0.710 - 0.712 percent, so depleted is <0.710 percent. When the production of uranium materials ceased in 1989, the inventory of depleted uranium on site totaled approximately 22.5 million pounds. Some materials were returned to suppliers, and the remaining inventory was relocated for future use, offered for sale, or, in the case of certain Army-owned materials, buried to prevent dissemination of sensitive information. To date, success with disposing depleted materials from Fernald follows:

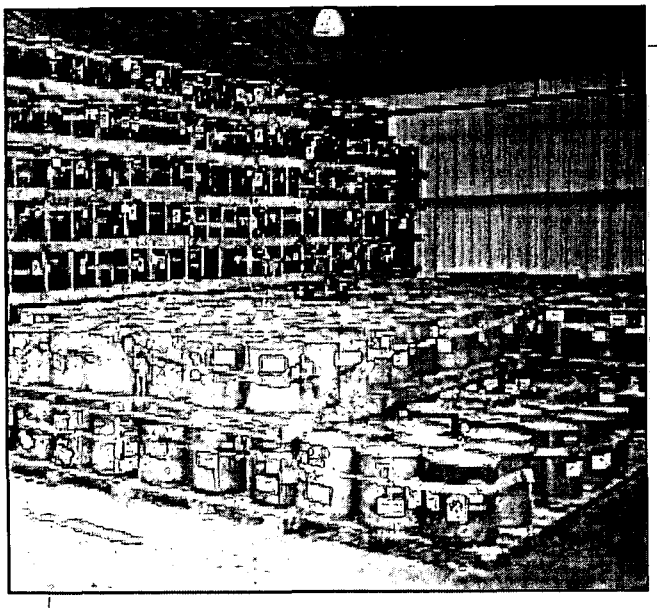
	~Net Pounds (millions)
Return of Material to Suppliers	1.782
Army (use or burial)	8.996
Programmatic Use	2.160
Private Sector	1.085
Total	**14.023**

The current depleted uranium inventory at Fernald is approximately 8.5 million pounds. Recent efforts between DOE's Oak Ridge Operations Office and the Fernald Environmental Management Project have led to the identification of potential use for nearly 84 percent of the current inventory. DOE, through detailed evaluations, concurred on a recommendation for declaration of waste for nearly 16 percent, or roughly 1,360,000 pounds, of depleted uranium. The material determined to have some potential use may ultimately be stored at the Oak Ridge facility as part of the DOE's "Uranium Center for Excellence."

The depleted uranium that will ultimately be declared waste will be shipped to the Nevada Test Site and buried.



Depleted uranium, when declared waste, will be low-level waste that can be buried at the Nevada Test Site (6082-20).



Depleted and enriched uranium tetrafluoride—or uranium compounds—stored in 10-gallon cans in Fernald's 4B warehouse (5881-93).

Normal Uranium

Normal uranium has the same isotopic level of natural uranium mined as ore, 0.711 percent, but is obtained by isotopic blending of depleted and enriched. Since the pedigree of Fernald's uranium in the 0.710 - 0.712 percent range cannot be traced to the natural feed, the inventory is called "normal." This material may have market interest and may also be stored at the Oak Ridge facility for future use. To date, success with disposing normal materials from Fernald follows:

	~Net Pounds (millions)
Return of Material to Suppliers	0.130
Programmatic Use	0.010
Private Sector	1.128
Total	**1.268**

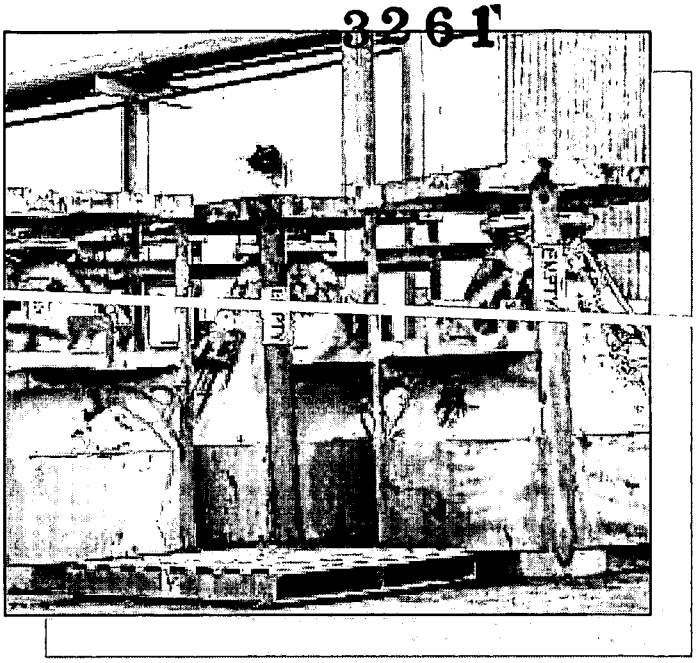
The current normal uranium inventory is approximately 0.438 million pounds. All of Fernald's normal uranium inventory will either be stored at the Oak Ridge facility or transferred to the private sector.

Enriched Uranium

Enriched uranium is material in which the U235 isotope has been increased above natural background levels. Fernald's enriched materials range from 0.713 to 19.9 percent U235, with only a few tons being greater than 5 percent U235. The bulk of the enriched materials contain either 0.95 or 1.25 percent U235. To date, success with disposing of enriched materials from Fernald follows:

	~Net Pounds (millions)
Return of Material to Suppliers	0.03
Private Sector	0.45
Waste	0.40
Total	**0.88**

The current enriched uranium inventory is approximately 6.3 million pounds. It is expected that about 31 percent of Fernald's enriched uranium will be disposed of as waste and 34 percent will be shipped off site to fulfill a current contract.



In September 1998, 131 T-Hoppers containing enriched uranium material were emptied and repackaged into 55-gallon drums. When the project was finished, approximately 1,395,000 pounds of enriched uranium had been repackaged into 1,655 drums. The drums have been loaded into sealand containers for shipment off site (6714-D256).

Approximately 35 percent may have market interest or will be stored at the Oak Ridge facility for future use.

◊◊◊

Summary

Many challenges have been overcome in an effort to dispose of Fernald's nuclear materials. For example, material stored in large, 2000-pound bulk storage containers known as T-Hoppers has been repackaged into 55-gallon drums. In addition, some materials have been vacuumed out of storage containers into very specific quantities to be shipped as fissile materials. All materials require specific, detailed plans in order to meet regulatory requirements. All of Fernald's nuclear materials are expected to be removed from the site by the end of 2000.

For More Information...

More information about Fernald's nuclear materials and other cleanup projects is available in the Public Environmental Information Center at 10995 Hamilton-Cleves Highway (Delta Building). Stakeholders can also learn more about the cleanup at Fernald's monthly briefings held on the second Tuesday of every month.

Questions about Fernald's nuclear materials should be directed to John Sattler, DOE-Fernald Waste Management team leader, 513-648-3145. For additional information about Fernald's cleanup, please visit Fernald's Web site (http://www.fernald.gov).

Graphics #5347 10/98